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R. F. LAWRENCE

NEW CAVERNICOLOUS SPIDERS OF SOUTH AFRICA

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NEW CAVERNICOLOUS SPIDERS FROM SOUTH AFRICA

By

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Natal Museum, Pietermaritzburg

(With 24 text-figures)

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INTRODUCTION

At the end of the last century only three species of cave arachnids had been described from South Africa, all of them spiders, by E. Simon (1893, 1894, 1896).

The number of Arachnida and Myriopoda known at the present time, including those described in the present paper, is twenty-two, seventeen of them being Araneae. Most of these have been taken from the Table Mountain and Kalk Bay caves in the Cape Peninsula, and the Cango Caves at Oudtshoorn. Specimens have also been collected in: Skeleton Cave, Oudtshoorn; Guano Cave, Hotpot and Onmeetbarediepgat, Bredasdorp; two small caves in Natal, at Champagne Castle in the Drakensberg and at Noodsberg in the New Hanover district. In the Transvaal Simon collected a number of arthropods at a small cave in the suburbs of Pretoria on the banks of the Apies River, and at the Makapan Cave near Potgietersrus. It is worthy of note that in the cave at Pretoria, Simon mentions (1894: 63) finding a number of specimens of an undescribed pseudoscorpion (*Chilifer, sic*) which he sent to M. Balzan for identification. In the Makapan Cave he discovered a new species of tenebrionid beetle, *Eurychora simoni*, and observed, but apparently did not collect, Myriapoda. Many of these caves are large, forming long horizontal galleries or extending deep below the surface, and almost all the specimens were collected in totally dark parts of the caves.

It is of interest to compare the numbers of cave Arachnida found in South Africa with those of neighbouring regions of the African continent. In 1931 Fage published a comprehensive list of cave spiders from all parts of the world, omitting however the three South African species already described by Simon.

According to this list no less than twenty-six species had been described from East Africa by Berland (1914) and Simon and Fage (1922) as compared with seventeen from South Africa up to 1963 and eight from the (Belgian) Congo (Leleup, 1956). It is possible that collecting in South African caves has not been as extensive as in East Africa.

The Congo has a much larger cavernicolous myriapod fauna than South Africa, Leleup (1956) listing nine species of Diplopoda and three of Chilopoda, while only one diplopod species has been found in the whole South African region and no Chilopoda. On the other hand only eight species of spiders have been recorded from the caves of the (Belgian) Congo.

A number of immature or incomplete specimens, which it has been impossible to describe and include in the South African faunal list, indicate that a fairly large number of South African cave spiders still await description. This would especially apply to the Bredasdorp caves, the Oudtshoorn caves other than the Cango Caves, and various caves in Natal and the Transvaal. It might also be interesting to explore for comparison some of the long tunnels which have recently been excavated for the South African railways, such as the 3-mile-long tunnel between Pietermaritzburg and Howick in Natal.

The large number of specimens placed at my disposal by Mr. J. R. Grindley of the South African Museum were collected by himself and other staff members of this Institution at various times between 1929 and 1961, and by the South African Spelaeological Association.

DESCRIPTIONS OF SPECIES

Family **Dictynidae**

Genus **HAEMILLA** E. Simon

Haemilla grindleyi n. sp.

(Fig. 1)

Holotype: 1 ♀ (S.A.M. 10004), Wynberg Caves, Table Mountain, collected J. R. Grindley, August 1956.

Colour: Carapace light reddish brown, its anterior margin a little darker, sternum reddish brown, mouthparts and chelicerae dark reddish brown; legs (including coxae) yellow brown, the apical segments reddish; pedipalps yellow brown, tibia and tarsus reddish brown. Abdomen dark olive green dorsally, with a series of indistinct lighter chevron markings, some intermixed lighter spots and stripes laterally, ventral surface olive green with a pair of widely separated parallel longitudinal lighter stripes.

Eyes: Anterior row with lower margins forming a straight line, medians less than a diameter apart, their own diameter from the laterals; posterior row distinctly procurved, medians a little more than their diameter apart, two diameters from the laterals; posterior medians distinctly larger than anterior medians, median quadrangle considerably wider behind than in front (by a

little less than the diameter of an anterior median), as long as or a very little longer than posteriorly wide; laterals subequal, subcontiguous, anterior medians 3-4 times their diameter from edge of clypeus.

Chelicera with 7-8 teeth on superior margin, 4-6 on inferior margin not much smaller than the superior ones.

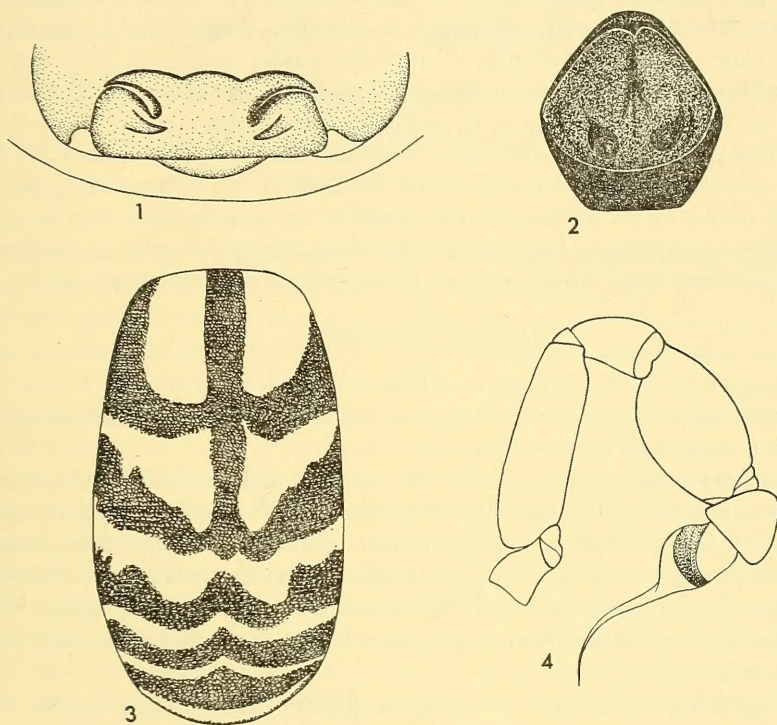


FIG. 1. *Haemilla grindleyi* n. sp. ♀. Vulva.

FIG. 2. *Haemilla profundissima* n. sp. ♀. Vulva.

FIGS. 3, 4. *Loxosceles valida* n. sp. ♂. 3, dorsal pattern of abdomen; 4, pedipalp from inner side.

Vulva as in fig. 1, resembling in its basic pattern those of *tuberculata* Lawr. and *tanganensis* Simon & Fage.

Calamistrum on metatarsus IV with a row of 33 modified hairs occupying only one-eighth of its total length; the segment slightly sinuous in the region of the calamistrum.

Legs: Patellae III and IV with 1 posterior spine, anterior patellae without; tibiae I and II with 2 pairs of inferior spines, 2 lateral pairs; metatarsi I and II with 4 lateral spines on each side, I with 1 small inferior spine at apex, II with 2 pairs of inferior spines. All tarsi with a ventral brush-like scopula, anterior legs with a metatarsal scopula in addition.

Pedipalp: Tibia and tarsus with a dense brush-like scopula, tarsus with 5-6 long spines in addition.

Dimensions: Length of carapace 5.1, abdomen 6 mm.

Further material: 1 immature ♀, Wynberg Caves (S.A.M. B10010), collected R. F. Lawrence, March 1931; 1 ♀, Kalk Bay Caves (S.A.M. B7894), collected R. F. Lawrence, July 1932; 3 ♀♀ (2 fragmentary) from Wynberg Caves (S.A.M. B10007, B10008, B10009), collected J. R. Grindley, August 1956; 1 immature ♀, Bats Cave (S.A.M. B10006), Table Mountain, collected J. R. Grindley, September 1960; 1 juvenile ♀, (S.A.M. B 10006), Oread Halls, Kalk Bay Caves (S.A.M. B10005), collected J. R. Grindley, June 1956.

The species seems to be nearest *tuberculata* Lawrence from Natal. It differs from all other species of the genus in the form of the vulva and in the small extent of the fourth metatarsus occupied by the calamistrum, this being only one-eighth (two-fifths in *tuberculata*) of its length. Only one other species, *cavernicola* Lawrence from Natal, appears to have been recorded from caves.

Haemilla profundissima n. sp.

(Fig. 2)

Holotype: 1 ♀ (S.A.M. B10011), Onmeetbarediepgat, Bredasdorp, Cape Province, collected C. Gow, July 1961.

Colour: Carapace light reddish brown; legs light reddish brown, the basal segments with an olive tinge, the mouthparts all dark reddish brown, sternum reddish brown, chelicerae blackish brown. Abdomen dorsally olive green with very numerous small light dots, a median stripe in anterior two-thirds with chevron markings and a row of ill-defined spots on each side, lighter; lateral surfaces with mixed spots and stripes, venter with two widely separated parallel white stripes.

Eyes: Anterior row from in front slightly procurved, subequal or the laterals a little larger, medians less than their diameter apart and a diameter from the laterals; posterior row from in front distinctly procurved, the medians distinctly smaller than anterior medians, subequal to the laterals, $1\frac{1}{2}$ -2 times their own diameter apart, 2-3 diameters from the laterals; laterals on each side the radius of a posterior lateral apart, the posterior distinctly smaller than the anterior; median quadrangle as long as posteriorly wide, wider behind than in front by the diameter of a posterior median eye, anterior medians the length of median quadrangle or 2-3 times their own diameter, from the edge of clypeus.

Mouthparts: Labium a little longer than in *tuberculata* Lawr. (cf. Lawrence 1939: 270, fig. 1b), reaching almost to the apices of the maxillae or more than three-fourths of their length.

Chelicerae: Inferior margin with 7-8 teeth, the distal 3 very small, superior margin with 7.

Vulva as in figure 2, differing remarkably from all other species in its basic pattern.

Legs: Tibia I and II with 3 inferior and 3 lateral pairs of spines, metatarsi apparently similar but the spines obscured by a thick brush of hairs on the under side of metatarsi and tarsi, and also on tibia I. Metatarsus IV with a slight sigmoid curve seen from above, the calamistrum very distinct, composed of about 45 stout modified hairs and occupying a little less than a third of its total length.

Dimensions: Length of carapace 5.3, abdomen 5.6 mm.

Family **Sicariidae**

Genus **LOXOSCELES** Lowe

Loxosceles valida n. sp.

(Figs. 3, 4)

Holotype: 1 ♂ (S.A.M. B10012), Echo Halt Caves, Table Mountain, Cape Town, collected J. R. Grindley, April 1954 (labelled No. 10).

Colour: Carapace in general rich reddish brown, cephalic portion with its lateral margins and 4 narrow parallel stripes behind the median eyes, thoracic portion with some large ill-defined radial markings from the foveal depression outwards, all a little darker than the background; chelicerae reddish brown; sternum light yellow brown, the margins narrowly reddish brown, an irregular cluster of blackish olivaceous spots in the middle; coxae infuscated in apical fourth, remainder yellow; labium reddish brown, maxillae a little lighter, the apices of both with narrow white border. Abdomen dorsally with a brown pattern on light yellow background (fig. 3), ventral surface mostly brown, ventral spinners with a light transverse band in basal half. All legs reddish-brown, femora I and II a little darker, metatarsi and tarsi I-IV a little lighter.

Carapace with a group of fairly coarse black bristles at anterolateral angle and behind the lateral eyes, cephalic portion with 7 distinct longitudinal rows of forwardly directed similar bristles, 3 behind the median, 2 behind the lateral eyes; thoracic portion with 3 weak rows of bristles on each side, the two posterior ones reaching the lateral margin, the anterior row abbreviated; sides of carapace with a regular marginal row of bristles but otherwise smooth, shiny.

Eyes of both the median and lateral pairs contiguous, a line joining the anterior laterals touching the posterior margins of the medians; median pair separated from the laterals by a little more than their combined width, from anterior margin of clypeus by $1\frac{1}{2}$ -2 times the long diameter of a median eye.

Chelicerae with a band of black bristles on the lateral half of its anterior surface; apex of chelicera ending in a large black triangular tooth on the inferior margin.

Legs without spines, very long and, as far as patellae, very strong; femora almost entirely smooth but the ventral surfaces of the anterior ones with numerous soft fine hairs in basal half. Tibiae and distal segments with regular rows of large spine-like black bristles increasing in length and slenderness distally, anterior tarsi with a weak scopula ventrally, the posterior ones with a distinctly

denser scopula and at the apices of metatarsi in addition. Legs I, II, IV, III, II only a little shorter and not weaker than I.

Pedipalp as in figure 4 seen from inner side; tarsus and tibia with coarse bristles, more numerous on inner than outer surfaces, more dense on tarsus than tibia; tarsus bluntly triangular, tibia much inflated, almost twice as deep as patella seen from the side (its depth two-thirds its greatest length), ovoid, much wider than the remaining segments seen from above.

Dimensions: Length of carapace 5.5, width 4.6; length of abdomen 7.3 mm. Leg I: femur 15, patella-tibia 22, metatarsus 21, tarsus 2.8 mm.

Further material: All the remaining material consists of females as follows: 1 ♀ (S.A.M. B10018), Powder Room Cave, Table Mountain, collected South African Spelaeological Association, March 1956. 1 ♀ (S.A.M. B10016), Wynberg Caves, Table Mountain, collected South African Spelaeological Association, February 1956. 1 ♀ (S.A.M. B10015), Devil's Pit, Kalk Bay, collected J. R. Grindley, June 1954. 1 immature ♀ (S.A.M. B10013), Tartarus Cave, Kalk Bay Mountains, collected J. R. Grindley, July 1961. 1 immature ♀ (S.A.M. B10017), Giant's Workshop, Table Mountain Caves, collected J. R. Grindley, July 1956. 1 immature ♀ (S.A.M. B7892), Wynberg Caves, Table Mountain, collected R. F. Lawrence, March 1931. 1 ♀ (S.A.M. B10014), Bats Cave, Table Mountain, collected J. R. Grindley, September 1960.

These specimens are in general smaller, with shorter legs than the ♂, leg I only about 3 times the body length. The distinctive pattern of the dorsum of abdomen is almost identical with that of the ♂ except that the transverse bars or chevrons are in some cases more numerous, 7-8 in number. Total length of largest ♀ (S.A.M. B10014 from Bats Cave), 14.5, leg I 43 mm.

Remarks: Five other species of *Loxosceles* are known from southern Africa: two from South West Africa, *bergeri* Strand and *simillima* Lawrence, two from the Cape Province, *pilosa* Purcell and *spinulosa* Purcell, and one from the Transvaal, *speluncarum* Simon. All these species are very much smaller, with shorter legs, the first being only 3 times or less the total length of body while in *valida* it is more than 6 times. The only other known cavernicolous species of the genus, *L. speluncarum*, was found in a cave in calcareous deposits of the Apies River valley near Pretoria, while Simon and Fage recorded an unidentified juvenile from Haitajwa Cave on Zanzibar Island (1922: 528). The new species has in all the specimens a strong, very clearly defined colour pattern, without the least sign of the depigmentation characteristic of cave animals.

Family **Leptonetidae**

Subfamily **Ochyroceratinae**

SPELEODERCES new genus

Carapace and abdomen well chitinized, the latter with large oval dorsal scute but no ventral scute. Eyes consisting of three widely separated pairs, two lateral and one median, as in *Cangoderces* Harison, but the median pair

situated much farther back. Chelicerae with 4 large teeth on superior margin; labium much wider than long; maxillae wide, fairly short, not meeting distally, their external and internal apices angular. Legs very long and slender, femora subparallel throughout. Patella of male pedipalp much longer than tibia and strongly toothed, remaining segments normal. Type-species of genus: *Speleodermes scutatus* n. sp.

Speleodermes scutatus n. sp.

(Figs. 5-8)

Holotype: 1 ♂, (S.A.M. B10019), Wynberg Caves, Table Mountain, collected South African Spelaeological Association, February 1956.

Colour: Carapace ventrally and dorsally yellow with an orange tinge, abdomen yellow white, dorsal scute a little darker, legs yellow white.

Carapace narrowing a little anteriorly, the anterior margin truncate but rounded at the antero-lateral angles.

Eyes as in figure 5, separated from anterior margin of carapace by an indistinct groove, the laterals on each side occupying a low indistinct rounded tubercle; position of posterior medians unusual in being well back, more or less in a line with the posterior of the two laterals; posterior medians well separated by about their own diameter from each other, far removed from the laterals on each side which are contiguous.

Mouthparts as in figure 6, labium very short, much wider than long, maxillae wide, their inner margins converging, the distal margins quite straight with both the inner and outer angles distinct though rounded.

Chelicerae: Claw very wide at base but narrowing abruptly in distal third, superior margin with 4 teeth, the basal one largest and well separated from the remaining three which are subgeminant; basal half of the claw with minute but very regular and distinct saw teeth (fig. 7).

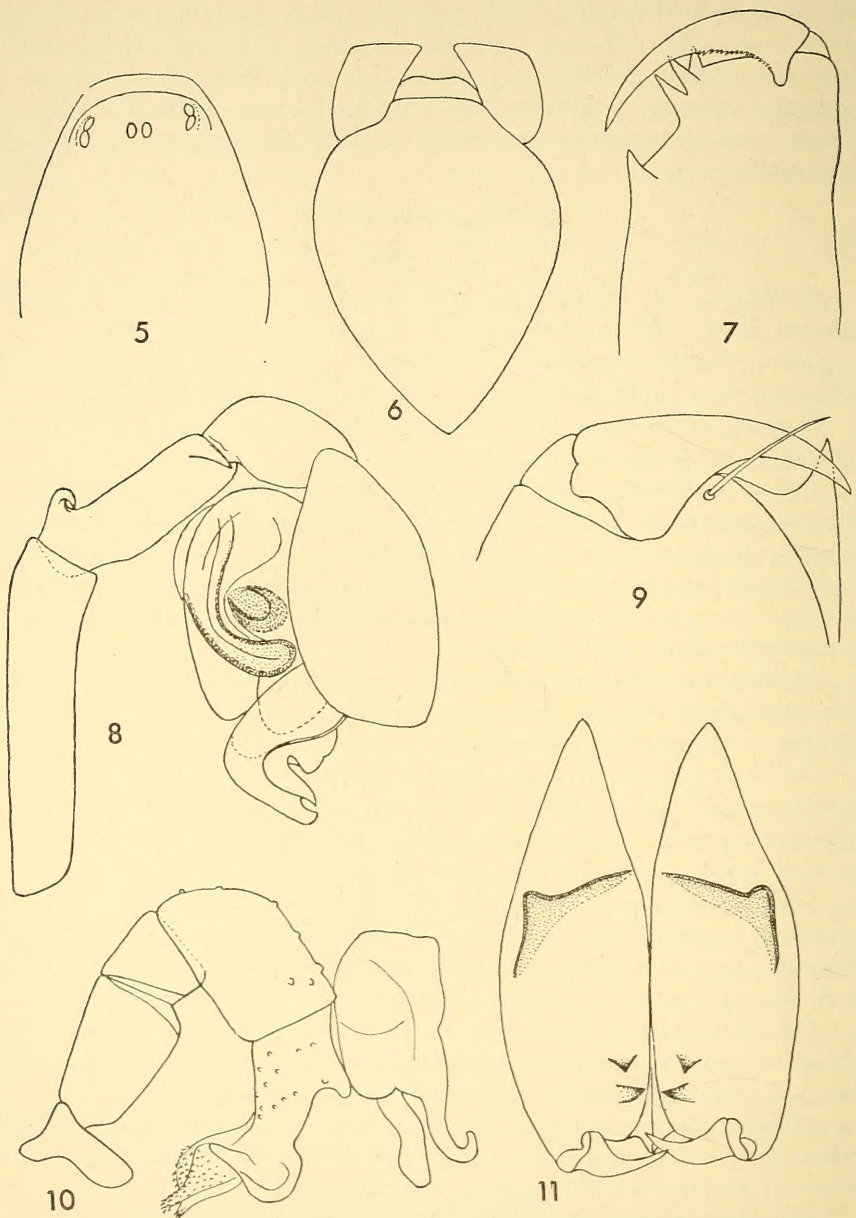
Legs very long and slender, the anterior longer than posterior pair, the femora not incrassate basally; all patellae at dorsal apex with 1, tibiae dorsally with 2 very long erect setae, legs clothed otherwise with series of fairly numerous, much shorter setae as in *Cangodermes lewisi* Harison (1951, p. 83, fig. 1).

Pedipalp as in figure 8 seen from outer side, patella much longer than tibia, subparallel, with a strong hooked tooth at its base directed dorsally and a little to the outer side, another large claw-like tooth at its apex.

Abdomen: Except on the scute, clothed with long slender setae, its dorsal surface with a large oval scute, not strongly chitinized but distinct, covering all except the posterior fifth or sixth of dorsal surface.

Dimensions: Length of carapace 0.65, of abdomen 0.85 mm.

Female: A single ♀ specimen (S.A.M. B10020) from Bats Cave, Table Mountain, collected by the South African Spelaeological Association, February 1956, is undoubtedly the female of this species. It differs from the male only in the somewhat shorter legs, more rounded abdomen and the total absence of a dorsal scute on the latter.



FIGS. 5-8. *Speleodermes scutatus* n. sp. ♂. 5, eyes from above; 6, sternum and mouthparts; 7, chelicera from below; 8, pedipalp from outer side.
 FIGS. 9-11. *Sperophora peninsulae* n. sp. ♂. 9, apex of chelicera; 10, pedipalp from outer side; 11, chelicerae from in front.

Dimensions: Total length 1.1 mm.

Remarks: The new genus appears to differ from all other genera of the family Leptonetidae interpreted in its widest sense to include the Ochyroceratidae. These differences lie in the arrangement of the eyes, the structure of the chelicerae, labium and maxillae, while in possessing a dorsal abdominal scute it seems to approach the Oonopidae. When the male of *Cangoderces* Harison has been discovered it may be found to be most nearly related to this genus.

Family **Pholcidae**

Genus SPERMOPHORA Henz

Spermophora peninsulae n. sp.

(Figs. 9-14)

Holotype, 1 ♂, *paratype*, 1 ♀ (S.A.M. B7897), Kalk Bay Caves, Cape Peninsula, collected R. F. Lawrence, September 1932.

Male (holotype)

Colour: The specimen completely bleached, the chitinous structures of the mouthparts and pedipalp a little darker; carapace dorsally and ventrally yellow, a little darker than the abdomen which is quite pale, legs pale.

Chelicerae: The fang stout and short, a very conspicuous triangular tooth on its margin proximal to the fang (fig. 9); anterior surface with two pairs of broad chitinous teeth near its apex (fig. 11), the more distal pair directed inwards, the second pair downwards; base of chelicera near clypeal margin with an oblique projecting ridge behind which is a depression extending almost the whole width of the segment.

Abdomen longish, cylindrical, rounded, considerably longer than that of ♀.

Pedipalp as in figure 10 seen from the outer side, tibia and basal part of tarsus with the sockets of numerous spines which in most cases have been lost.

Legs: I, IV, II, III.

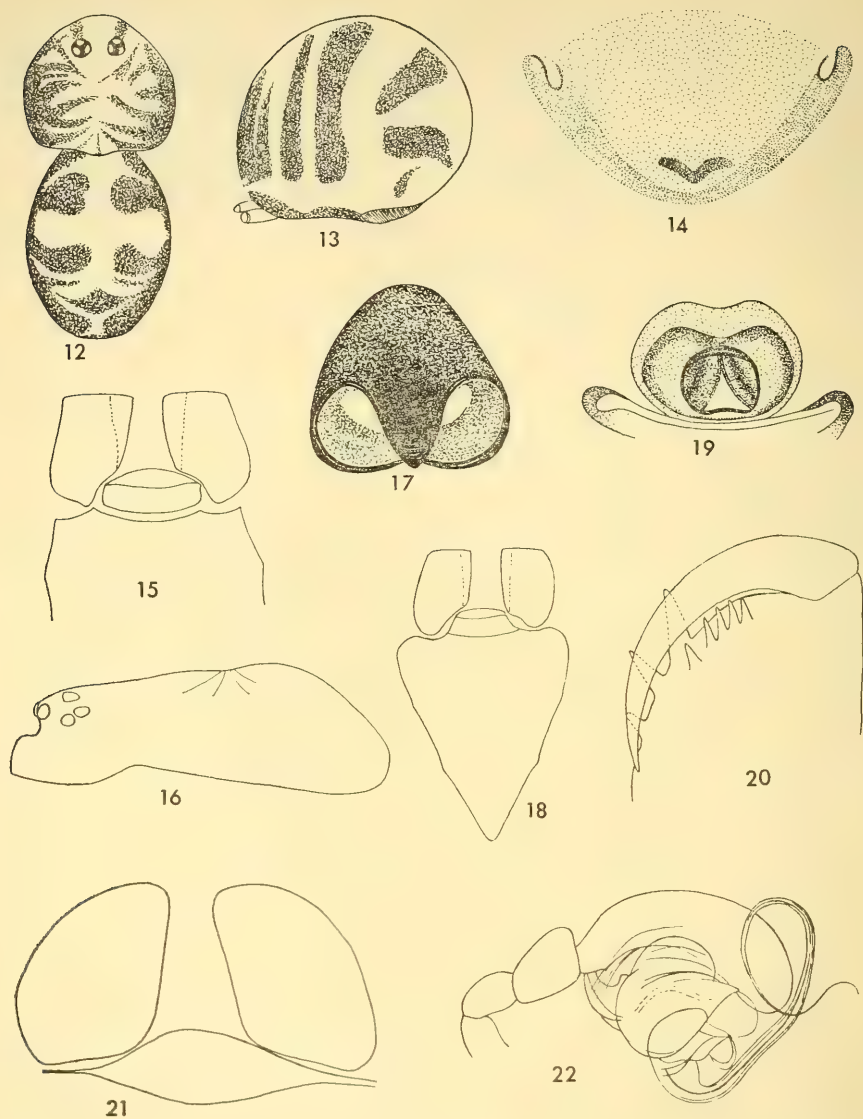
Dimensions: Total length 2.6 mm.

Female (paratype)

Colouring similar to that of the ♂; chelicerae unmodified; the chitinized parts of the epigastric area as in figure 14; pedipalp with long, slender, pointed tarsus; legs very long, the femora long and stout, almost twice as wide at base as at apex.

Dimensions: Length of carapace 1.1, length of abdomen 1.9 mm.

Remarks: Another ♂ from the Kalk Bay Cave system (Oread Halls, collected J. R. Grindley, June 1954, S.A.M. B10021) has a jet-black sternum and indistinct markings on the abdomen, but the pedipalp is structurally similar to that of the holotype ♂. Four tubes of female *Spermophora* from the Wynberg and Powder Room caves I assume to be the same species as the types, although in the types all traces of any original colour pattern have been lost after more than 30 years of immersion in alcohol.



FIGS. 12-14. *Spermophora peninsulae* n. sp. ♀. 12, dorsal colour pattern; 13, the same of another ♀ from the side; 14, epigastric region.

FIGS. 15-17. *Teutana fagei* n. sp. ♀. 15, mouthparts and anterior margin of sternum; 16, carapace seen in profile; 17, vulva.

FIGS. 18, 19. *Theridion proxima* n. sp. ♀. 18, mouthparts and sternum; 19, vulva.

FIGS. 20-22. *Lepthyphantes rimicola* n. sp. 20, chelicera of ♀; 21, mouthparts of ♀; 22, pedipalp of ♂ seen from the side.

The colouring of the female from Powder Room Cave (S.A.M. B10023) is as follows:

Colour: Carapace with dark but not black markings, as in figure 12, a fairly wide and distinct though slightly crenulated blackish stripe passing forward from each ocular group to edge of clypeus, these diverging slightly anteriorly; chelicerae and mouthparts brown, sternum blackish brown, a little lighter in the middle, contrasting strongly with the yellow coxae. Abdomen with black markings dorsally as in figure 12, a cuneiform white marking at posterior apex just above the spinners, seen from the side as in figure 13 (drawn from another ♀, Wynberg Caves, S.A.M. B10024, collected August 1956); ventral surface with a wide median black band widening to include the epigastric area which is brown and separated on each side by a fairly narrow sinuous white stripe from the blackish sides of the abdomen. Legs yellow with a reddish tinge, tibiae with a narrow, lighter apical annulation.

Further material: 1 ♀ (S.A.M. B10023) with about 24 eggs, Powder Room Cave, collected Spelaeological Association, March 1956; 2 ♀♀ (S.A.M. B10022 and B10024), Wynberg Caves, collected J. R. Grindley, August, 1956; 1 ♂, 2 ♀♀ (S.A.M. B10021), Oread Halls, collected J. R. Grindley, June 1954; 1 ♀ (S.A.M. B10021), Bats Cave, Table Mountain, collected South African Spelaeological Association, February 1956; 4 ♀♀ (S.A.M. B7896), Wynberg Caves, Table Mountain, collected R. F. Lawrence, September 1932; 1 ♂ (S.A.M. B7895), Wynberg Caves, Table Mountain, collected R. F. Lawrence, March 1931.

Simon (1892-1903: 471) writes of two types of colouring, pale species occurring in caves and houses, strongly pigmented ones under stones; all the four East African species, *ensifera*, *globosa*, *minotaura* and *nigrescens*, appear to belong to the latter group. Unfortunately no adult males are present among the Wynberg Caves material and in their absence I have assumed these specimens to be identical with the Kalk Bay Caves species, the absence of pigmentation in the type of the latter being due to prolonged immersion in alcohol.

The only species of this genus hitherto found in caves is *S. minotaura* Berland from the Campbell Cave, Kenya, though it has also been found in the forests of Kenya at high and low altitudes.

Genus SMERINGOPUS Simon

Smeringopus pallidus (Blackwall)

One immature ♀, (S.A.M. B10025), Skeleton Cave, Oudtshoorn, collected J. R. Grindley, September 1961.

Although immature the colouring of the single specimen resembles that of the female of *pallidus* (= *elongatus*) as redescribed by Kraus (1957: 220, fig. 6). No species of the genus appears to have been described from caves but specimens of *Smeringopus* are often found near the entrance of many caves and should be regarded as troglaphiles rather than troglobionts.

Family **Theridiidae**Genus **TEUTANA** Simon*Teutana fagei* n. sp.

(Figs. 15-17)

Holotype: 1 ♀ (S.A.M. B10026), Skeleton Cave, Oudtshoorn, Cape Province, collected by J. R. Grindley, September 1961.

Colour: Carapace, sternum and mouthparts brown with a slight reddish tinge, the radiations from the thoracic fovea a little darker, otherwise without markings. Legs, coxae to tarsi uniform brown with a faint olive tinge; abdomen above reddish violet, a recurved white transverse stripe at anterior apex with a short backwardly projecting stripe in the middle, posterior to this two pairs of ill-defined elongate white markings, above the spinners a short median elongate marking followed by a transverse series of 3-4 very fine white lines; ventral surface with a large comma-shaped white marking laterally to each operculum, posterior to this two elongate, inwardly directed white stripes, the second considerably smaller than the first; between the spinners and epigastric furrow, a large vase-shaped, ill-defined lighter marking (somewhat similar to the well-defined red marking on the venter of *Latrodectus geometricus*), vulva and opercula blackish brown.

Carapace seen from the side level but slightly depressed in the region of the thoracic fovea, which is deep, transversely arcuate and slightly recurved, clypeus strongly rounded and projecting, with a well-marked transverse groove just below the eyes separating them from the rest of the clypeus (fig. 16).

Eyes: Anterior row from above slightly recurved, from in front straight, medians subequal to laterals or a very little smaller, less than their diameter apart and about the same distance from the laterals; posterior row slightly recurved seen from above, medians a little more than their own radius apart, about a diameter from the laterals which are a little larger. Median quadrangle longer than posteriorly wide, a little wider behind than in front; clypeus about $1\frac{1}{2}$ times length of median quadrangle.

Chelicera: Inferior margin with 2 or 3 small, indistinctly geminate teeth.

Mouthparts: Labium at least twice as wide as long, the anterior apex not triquetrous, more or less truncate, straight in the middle, somewhat rounded at the sides, its apex falling well below the middle point of the maxillae (fig. 15).

Vulva as in figure 17, the median septum very strongly chitinized, blackish, ill-defined.

Legs unspined, with rows of weak setae and soft hairs.

Dimensions: Carapace 3.3, length of abdomen 7, width 5.3 mm.

Further material: 1 smaller ♀ (S.A.M. B10027) from Onmeetbarediepgat, Bredasdorp, Cape Province, collected C. Gow, July 1961.

The species differs from the two species of *Teutana* described by O. P. Cambridge from the Cape Peninsula, *lepida* and *connexa*, at least in its larger size and detailed differences in the pattern of the vulva, while agreeing with them in

the colouring of the ventral surface. It differs from *T. albovittatus* Lawrence from the Umfolosi River, Zululand, in its considerably larger size, colour pattern of abdomen and structure of the vulva. Only one other species of the genus, *T. grossa*, appears to have been recorded from caves (in Europe only).

Genus THERIDION Walck

Theridion proxima n. sp.

(Figs. 18, 19.)

Holotype: 1 ♀ (S.A.M. B10028), Skeleton Cave, Oudtshoorn, Cape Province, collected J. R. Grindley, September 1961.

Colour: Carapace yellow with a very fine brown margination, cephalic portion and thoracic fovea brown, eyes surrounded by blackish brown rings, chelicerae light olive brown contrasting with the yellow clypeus; sternum yellow brown with narrow blackish brown margin, mouthparts light reddish brown. Legs yellow, the femora with 2 subapical, tibiae with 4 blackish annulations, metatarsi with smaller basal middle and apical annulations, the middle one faint or obsolete. Abdomen dorsally as in Tullgren's description of *kibonotense* and O. P. Cambridge's *purcellii*, the black area surrounding the light median longitudinal band diffuse, a large white marking on each side in posterior third near the lateral margin; ventral surface with spinners surrounded by a blackish ring which is continuous with the median blackish area of dorsal surface, a medium-sized white spot below the epigastric fold.

Eyes seen from above with anterior row slightly recurved, medians a little larger than laterals, about their diameter apart and a little less from the laterals; posterior row well procurved, medians distinctly larger than the laterals, three-fourths their diameter apart, their diameter or a little more from the laterals; laterals touching on each side, the posterior distinctly smaller than anterior; median quadrangle a little wider in front than behind, a little wider than long; clypeus about $1\frac{1}{2}$ times the length of median quadrangle.

Mouthparts: Labium much wider than long, its anterior margin truncate, almost straight, with a row of 6 long black setae, the segment reaching to about a third the length of the perpendicular maxillae (fig. 18).

Legs: I, IV, II, III; femora with 2 inferior rows of setae mounted on small round tubercles, those of leg II much more regular than the others (the setae of femur I largely missing), each row with 12–15 setae; patella with a long, strong, black seta at dorsal apex; anterior tibiae with 1–3 similar dorsal setae, IV with 4; metatarsi with a ventral row of setae, those of II stronger and more regular than the others; tarsus IV with a row of 6 long, slender modified hairs diminishing progressively in length distally.

Vulva as in figure 19 resembling that of *T. kibonotense* in its general pattern.

Dimensions: Length of carapace 2, length of abdomen 3.6 mm.

Remarks: The species obviously resembles Tullgren's *kibonotense* (1910) and O. P. Cambridge's *purcellii* (1903) both in colouring and the basic pattern of

the vulva, but of the two is probably more closely related to *kibonotense*. About 17 species of this large and widespread genus are known from southern Africa, including an almost cosmopolitan form often found in greenhouses, *T. tepidarium* C. L. Koch; *Theridion rufipes* Lucas has been recorded from caves in Spain.

Family **Linyphiidae**

Genus **LEPHTHYPHANTES** Menge

Lephtyphantes rimicola n. sp.

(Figs. 20-23)

Holotype, 1 ♀, *paratypes*, 1 ♂, 2 ♀♀ (S.A.M. B7893), Wynberg Caves, Table Mountain, collected R. F. Lawrence, March 1931.

Female (holotype)

Colour: Carapace and legs yellow to white without markings, the eyes surrounded by black rings, posterior medians connected with anterior medians

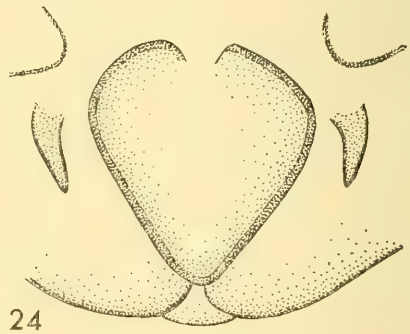
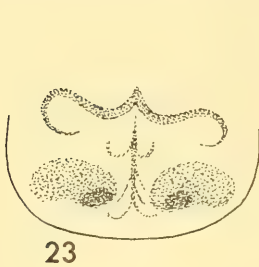


FIG. 23. *Lephtyphantes rimicola* n. sp. ♀. Vulva.

FIG. 24. *Phanotea gowi* n. sp. ♀. Vulva.

by a subtriangular black marking spanning the space between them; abdomen much faded but darker than remainder of body, light terracotta with a number of large round indistinct blotches.

Eyes: Posterior row slightly procurved, the medians distinctly the largest of all the eyes; anterior row straight to very slightly recurved, the medians much the smallest of all the eyes, half the diameter of an anterior lateral and close to each other; laterals contiguous, the anterior a little smaller than the posterior; median quadrangle as long as posteriorly wide, much wider behind than in front; clypeus a little less than the length of median quadrangle.

Mouthparts as in figure 21, maxillae very wide, subparallel, labium semi-circular, much wider than long; chelicerae as in figure 20, fang long and robust, superior margin with 3 large teeth, the basal smallest, inferior margin with 5 distinctly smaller sharp teeth, the basal separated from the others which

are subcontiguous. Chelicerae subparallel, not narrowing much distally; sternum cordiform, its anterior margin very wide and almost straight.

Vulva as in figure 23.

Legs I–IV long and very slender, the femora ventrally with a more or less regular series of long, fine setae; remaining segments with long, slender, erect dorsal setae as follows (the seta on the patella much longer than any others): patella at apex with 1 almost as long as the segment, tibia with 2 or 3 in distal half, these about a third the length of the segment; metatarsus with 1 subbasal seta, tarsus without; legs otherwise clothed with regular rows of numerous short, weak setae.

Pedipalp tarsus long, slender, longer than tibia, its apex with a long edentate claw, not much thicker than the adjacent setae.

Male (*paratype*)

Not differing from the female except that the chelicerae are somewhat more divergent and more tapered apically, the legs relatively longer and more slender. Carapace not modified, in general similar to that of the ♀.

Pedipalp as in figure 22 seen from the side, very complex, the embolus very long and sinuously curved.

Dimensions: ♀: Length of carapace 0.9, of abdomen 1.2 mm. ♂: Total length 1.9 mm.

Remarks: The material on which the new species is based is very old and fragile but it will be possible to check the description and figures from fresh material which should not be difficult to obtain as the spiders are fairly common, spinning small sheet webs 25–35 mm. in diameter across the fissures in the vertical rock walls of the cave.

The Linyphiidae are very little known in South Africa and I have considerable doubt as to whether this cave form really is a species of *Lepthyphantes* or whether a new genus is required for it. In some respects it agrees with *Linyphia* (in the appearance of the male pedipalp, with the British species *Linyphia* (*Agyneta*) *cauta* O. P. Cambridge). No members of this genus, however, appear to inhabit caves. In the considerable reduction of the anterior median eyes it agrees with various genera from different parts of the world, such as *Porrhomma*, *Troglohyphantes* and *Asthenargus*, the latter being represented by the species *A. inermis* in East African grottoes; from all of these, however, it also differs in at least one important character.

Family **Agelenidae**

Subfamily **Cybaeinae**

Genus PHANOTEA Simon

Phanotea gowi n. sp.

(Fig. 24)

Holotype: 1 ♀ (S.A.M. B10029), Guano Caves, Bredasdorp, Cape Province, collected C. Gow, July 1961.

Colour: Legs and carapace yellow to orange, carapace becoming progressively more reddish anteriorly; sternum yellow, the margins orange, mouthparts reddish brown, chelicerae dark reddish brown.

Eyes: Anterior row slightly recurved, medians distinctly smaller than the laterals, less than their own diameter apart, about a diameter from the laterals; posterior row a little procurved, medians a little smaller than anterior medians, laterals smaller than anterior laterals, medians their own diameter apart, 2 diameters from the laterals; median quadrangle distinctly longer than posteriorly wide, a little wider behind than in front; anterior medians a little more than their own diameter from the edge of the clypeus.

Chelicerae very strong, inflated and rounded in front, a deep anterior constriction near their bases below the clypeus; lower margin with only 2 small subequal teeth, differing in this respect from all other species of the genus; superior margin with 3 teeth, the middle one large.

Pedipalp with thick scopula ventrally on the distal two-thirds of tarsus.

Vulva as in figure 24, with a large median plano-convex cordiform plate overlying two posterior sclerites which almost meet in the middle line below it.

Legs: Patellae unspined; tibia I and II with 4 inferior pairs of spines, metatarsus I and II with 3 inferior pairs, I with 2 anterior lateral spines in addition, II without lateral spines, tarsus and most of metatarsus I with a distinct scopula, II with a distinct scopula only on tarsus; tibia III and IV with 3 inferior irregularly paired spines, 2 pairs of lateral spines, metatarsus III and IV with 3 inferior pairs, 3 lateral pairs and 1 or 2 superior spines in addition; tarsi III and IV but not metatarsi with distinct scopula.

Dimensions: Length of carapace 6.4, total length 15.3 mm. (including chelicerae).

Further material: One specimen, Hotpot, Bredasdorp, Cape Province, collected South African Spelaeological Association, May 1960.

The genus consists mostly of cave-living species, *natalensis*, *simoni* and *peringueyi*; it appears to be most closely related to *peringueyi* in the eye disposition and spine formula of the legs but can be easily distinguished from it by having only 2 instead of 3 teeth on the inferior margin of chelicera and in the pattern of the vulva.

Subfamily **Hahniinae**

A single, very fragile and much bleached subadult male from the Wynberg Caves (S.A.M. B7896), collected R. F. Lawrence, September 1932, is evidently a member of this subfamily, several species of which have been recorded from caves.

The spinners are long and slender, arranged in a more or less transverse row with the superior pair especially long, the apical segment being subequal to the basal in length. There are, however, only six eyes, all of them large with the anterior medians absent, the general arrangement similar to that of *Bigois* Simon from the Philippine Islands, in which, however, the anterior median

eyes, though minute, are present. It does not seem to be closely related to *Scotussa zodarioides* Simon, the only member of the subfamily recorded from the Cape Peninsula, and a new genus may have to be created for its reception.

A LIST OF THE CAVERNICOLOUS ARACHNIDA AND MYRIAPODA OF SOUTH AFRICA

ARANEAE		
<i>Species</i>	<i>Family</i>	<i>Locality</i>
1. <i>Haemilla cavernicola</i> Lawrence, 1939	Dictynidae	Noodsberg Caves, Natal.
2. <i>Haemilla grindleyi</i> Lawrence, 1964	„	Wynberg Caves, Table Mt., and Kalk Bay Caves, Cape.
3. <i>Haemilla profundissima</i> Lawrence, 1964	„	Onmeetbarediepgat, Bredas- dorp, Cape.
4. <i>Phyxelia makapanensis</i> E. Simon, 1894	„	Makapan Cave, Transvaal.
5. <i>Loxoscles speluncarum</i> E. Simon, 1893	Sicariidae	Apies River Cave, Pretoria, Transvaal.
6. <i>Loxosceles valida</i> Lawrence, 1964	„	Wynberg Caves, Table Mt., Cape.
7. <i>Speleodermes scutatus</i> Lawrence, 1964	Leptonetidae	Wynberg Caves, Table Mt., Cape.
8. <i>Cangodermes lewisi</i> Harison, 1951	„	Cango Caves, Oudtshoorn, Cape.
9. <i>Spermophora peninsulæ</i> Lawrence, 1964	Pholcidae	Wynberg Caves, Table Mt., and Kalk Bay Caves, Cape.
10. <i>Smeringopus pallidus</i> (Blackwall), 1858	„	Skeleton Cave, Oudtshoorn, Cape.
11. <i>Teutana fagei</i> Lawrence, 1964	Theridiidae	Skeleton Cave, Oudtshoorn, Cape.
12. <i>Theridion proxima</i> Lawrence, 1964	„	Skeleton Cave, Oudtshoorn, Cape.
13. <i>Lephtyphantes rimicola</i> Lawrence, 1964	Linyphiidae	Wynberg Caves, Table Mt., Cape.
14. <i>Phanotea peringueyi</i> E. Simon, 1896	Agelenidae	Cango Caves, Oudtshoorn, Cape.
15. <i>Phanotea natalensis</i> Lawrence, 1951	„	Noodsberg Caves, Natal.
16. <i>Phanotea simoni</i> Lawrence, 1951	„	Champagne Castle Cave, Drakensberg, Natal.
17. <i>Phanotea gowi</i> Lawrence, 1964	„	Guano Cave, Bredasdorp, Cape.

OPILIONES

<i>Species</i>	<i>Family</i>	<i>Locality</i>
18. <i>Speleosiro argasiformis</i> Lawrence, 1931	Sironidae	Wynberg Caves, Table Mt., Cape.
19. <i>Speleomontia cavernicola</i> Lawrence, 1931	Triacononychidae	Wynberg Caves, Table Mt., Cape.
20. <i>Larifuga</i> sp. (1964)	„	Wynberg Caves, Table Mt., Cape.

PSEUDOSCORPIONES

21. <i>Chthoniella cavernicola</i> Lawrence, 1935	Chthoniidae	Wynberg Caves, Table Mt., Cape.
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DIPLOPODA

22. <i>Harpethrix caeca</i> Lawrence, 1962	Sphaerotrichopidae	Wynberg Caves, Table Mt., Cape.
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SUMMARY

Nine new species of cavernicolous spiders from South Africa are described, one of which is included in a new genus. The new species are: *Haemilla grindleyi*, *Haemilla profundissima*, *Loxosceles valida*, *Speleodermes scutatus* (new genus), *Spermophora peninsulæ*, *Teutana fagei*, *Theridion proxima*, *Lepthyphantes rimicola* and *Phanotea gowi*. A list is given of the twenty-two species of Arachnida and Myriapoda now known from South Africa.

ACKNOWLEDGEMENT

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INSTRUCTIONS TO AUTHORS

MANUSCRIPTS

In duplicate (one set of illustrations), type-written, double spaced with good margins, including TABLE OF CONTENTS and SUMMARY. Position of text-figures and tables must be indicated.

ILLUSTRATIONS

So proportioned that when reduced they will occupy not more than $4\frac{3}{4}$ in. \times 7 in. ($7\frac{1}{2}$ in. including the caption). A scale (metric) must appear with all photographs.

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Authors' names and dates of publication given in text; full references at end of paper in alphabetical order of authors' names (Harvard system). References at end of paper must be given in this order:

Name of author, in capitals, followed by initials; names of joint authors connected by &, not 'and'. Year of publication; several papers by the same author in one year designated by suffixes a, b, etc. Full title of paper; initial capital letters only for first word and for proper names (except in German). Title of journal, abbreviated according to *World list of scientific periodicals* and underlined (italics). Series number, if any, in parenthesis, e.g. (3), (n.s.), (B). Volume number in arabic numerals (without prefix 'vol.'), with wavy underlining (black type). Part number, only if separate parts of one volume are independently numbered. Page numbers, first and last, preceded by a colon (without prefix 'p'). Thus:

SMITH, A. B. 1956. New *Plonia* species from South Africa. *Ann. Mag. nat. Hist.* (12) 9: 937-945.

When reference is made to a separate book, give in this order: Author's name; his initials; date of publication; title, underlined; edition, if any; volume number, if any, in arabic numerals, with wavy underlining; place of publication; name of publisher. Thus:

BROWN, X. Y. 1953. *Marine faunas*. 2nd ed. 2. London: Green.

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SMITH, C. D. 1954. South African *plonias*. In Brown, X. Y. *Marine faunas*. 2nd ed. 3: 63-95. London: Green.

SYNONYMY

Arranged according to chronology of names. Published scientific names by which a species has been previously designated (subsequent to 1758) are listed in chronological order, with abbreviated bibliographic references to descriptions or citations following in chronological order after each name. Full references must be given at the end of the paper. Articles and recommendations of the *International code of zoological nomenclature adopted by the XV International congress of zoology, London, July 1958*, are to be observed (particularly articles 22 and 51).

Examples: *Plonia capensis* Smith, 1954: 86, pl. 27, fig. 3. Green, 1955: 23, fig. 2.

When transferred to another genus:

Euplonia capensis (Smith) Brown, 1955: 259.

When misidentified as another species:

Plonia natalensis (non West), Jones, 1956: 18.

When another species has been called by the same name:

[non] *Plonia capensis*: Jones, 1957: 27 (= *natalensis* West).



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